NOTES ON *CHELONARIUM LECONTEI* THOMSON (COLEOPTERA: CHELONARIIDAE), INCLUDING DESCRIPTION OF AN UNUSUAL RIGHTING BEHAVIOR

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Abstract

Adults of the rare beetle *Chelonarium lecontei* Thomson were collected at the same locality in Arkansas in 3 consecutive years. All specimens examined were males. Captured beetles survived as long as 1 month in the laboratory. Characteristically, they exhibited an unusual righting behavior, utilizing the genitalia.

Chelonarium lecontei has been termed an "extremely rare subtropical beetle" (Edwards 1949). It is known only from the southeastern United States, from Florida north to North Carolina and Tennessee and west to Arkansas and eastern Texas (Brown 1975; Tuff 1975). It is the lone species in the United States, although the genus *Chelonarium* contains over 200 species, distributed throughout tropical America (Blackwelder 1944).

On June 23, 1973, 2 specimens were collected at the locality described herein. This inspired return trips to attempt to capture and study live specimens.

Collecting Notes

In June 1974, 28 adults of *Chelonarium lecontei* were collected in the St. Francis National Forest, Lee County, Arkansas. The most productive site was the Maple Flats campground, on a ridge covered by mature oak-hickory forest about 100 feet above and 1/2 mile from Bear Creek Lake.

All beetles were taken at lights. Ultraviolet and white fluorescent lights were considerably more attractive than were propane lanterns, which accounted for only 3 of the beetles collected. The prime period for collecting was the first two hours following dusk. The warmest, most humid night (June 28) of the three on which collections were made (June 26-28) yielded the largest number of beetles (14).

Sex was determined for 22 of the 28 adults taken in 1974; all were males. Two specimens captured by us at light on July 4, 1975, were males also. Presumably, females are less active flyers than males or are not so strongly attracted by light. We note in passing, however, that Tuff's (1975) record of the occurrence of *Chelonarium lecontei* in Texas was reportedly based on a female taken at light.

Laboratory Observations

In the laboratory in Urbana the 28 beetles collected in 1974 were divided evenly among 4 8-ounce Dixie cups, each provided with a wick moistened

with a sugar-water solution. The cups were kept at 100% R.H. in a glass jar placed in an incubator at 80°F on a 12 hour light:12 hour dark cycle. Under this regime, all adults lived at least two weeks; the last survivor lived 30 days.

In an attempt to determine something of the habitat preference of *C. lecontei* adults, we set up a 10-gallon terrarium containing the following elements: sand, mud, gravel, moss, smartweed (*Polygonum*), sticks, rocks, and a pond of water with algae. When 6 beetles were placed in this environment, all avoided the pond and eventually crawled onto the sticks or *Polygonum* and became quiet. The next morning, however, 3 beetles were found floating helplessly on the water; one of them was dead, the other 2 still alive. Possibly they fell into the pond after colliding with the walls of the enclosure during flight in the dark. At any rate, our observations suggest that adults of *C. lecontei* are not aquatic.

Whether larvae of *Chelonarium,* like those of other dryopoids, are aquatic is highly problematical. Possibly they inhabit damp moss and are found in streams only occasionally as a result of being washed off the moss (Brown 1972). We hope the present report of a reliable collecting site for adults of *C. lecontei* will eventually lead to discovery and description of the larva of this species as well as to study of larval and adult biology.

Adults of *C. lecontei* are extremely docile, and their behavior is easily observed. When at rest the adult assumes a posture in which the legs are extended, supporting the body; the head is retracted halfway into the pronotum; and the antennae are directed beneath the body. At times, especially following a disturbance, all appendages are retracted to a position flush with the ventral surface of the body; in this posture the adult has all the appearance of a seed. When the adult is walking, the head is extended to the point where the beadlike head is visible dorsally, and the antennae are used to probe and tap the substrate.

Many Coleoptera have difficulty in righting themselves from an inverted position on a flat surface. The problem is especially acute for a

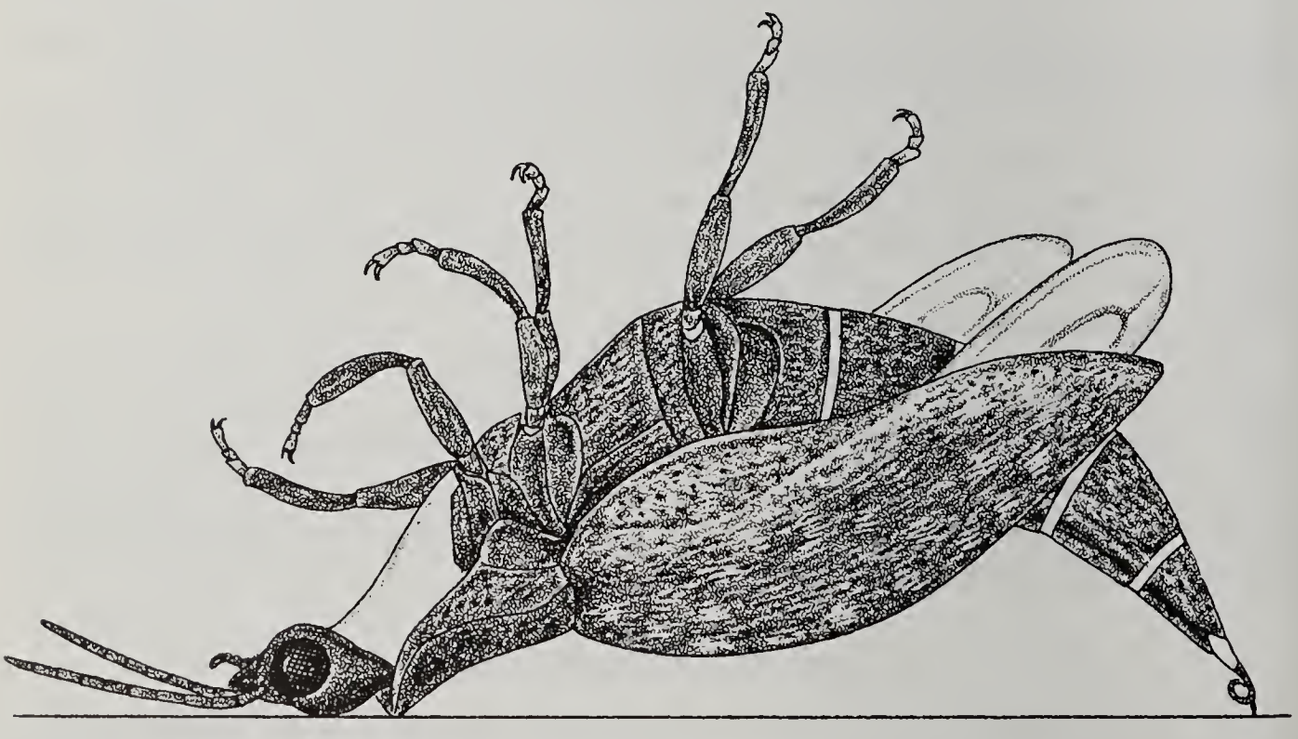

Fig. 1. Righting behavior of male *Chelonarium lecontei.*

chelonariid because of the unusually compact, convex form of the body and the shortness and restricted sphere of movement of the legs. An adult of *C. lecontei* that has been placed or has fallen on its back first attempts to right itself, after a period of retraction of the appendages, by flailing its legs in an apparent attempt to grasp. Often this behavior is accompanied by partial opening of the elytra. Less commonly the wings are unfolded and the beetle attempts to fly while upside down.

After a short period of the type of behavior just described, the adult partially opens the elytra and extends the genitalia posteriorly. As the genital tube lengthens, the abdomen curves downward (dorsad with respect to the adult) until the sclerous distal process of the median lobe, which is coiled in a loop, contacts the substrate (Fig. 1). Pressure of the lobe on the substrate lifts the beetle to a position where it touches the substrate at 3 points: the dorsum of the head, the anterior edge of the dorsum of the pronotum, and the tip of the genitalia. From this position the beetle is able to turn to one side or the other, thereby bringing the legs on one side near the substrate, where they can be used effectively to pull the beetle over into an upright posture. All males examined exhibited this behavior.

The male genitalia of *C. lecontei,* which have not been described, differ conspicuously from those of *C. zapotense* Sharp, as figured by Sharp and Muir (1912), in having only a single distal process of the median lobe.

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